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EXAMINER	
YAM, STEPHEN K	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/917,400	Applicant(s) HILL, HENRY A.
	Examiner Stephen Yam	Art Unit 2878

-- The MAILING DATE of this communication appears on the cover sh et with th correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36 and 38-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *22,24,46 and 47* is/are allowed.

6)☒ Claim(s) *1-11,13-17,23,25-31,33-35 and 38-45* is/are rejected.

7)☒ Claim(s) *12,18-21,27,32 and 36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This action is in response to Amendments and remarks filed on October 9, 2003. Claims 1-36 and 38-47 are currently pending.

Claim Objections

1. Claim 15 is objected to because of the following informalities:

In Claim 15, "the cavity" should be replaced with "the optical cavity".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, 6, 15, 17, 29, 30, and 38-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Korth US Patent No. 5,327,223.

Regarding Claim 1, Korth teaches (see Fig. 1) a multiple source array for illuminating an object (1), the multiple source array comprising a reflective mask (2) having an array of spatially separated apertures (see Col. 4, lines 64-66), at least one optic (25) (see Fig. 2) positioned relative to the mask to form an optical cavity with the mask (see Col. 2, lines 15-20), and a source (3) providing electromagnetic radiation to the optical cavity to resonantly excite (see Col. 2, lines 15-20) a mode supported by the optical cavity, wherein during operation a portion of the

electromagnetic radiation built-up in the cavity leaks through the mask apertures towards the object (see Col. 4, liens 65-66), and wherein each aperture has a transverse dimension smaller than the vacuum wavelength of the electromagnetic radiation provided by the source (see Col. 2, lines 33-41).

Regarding Claim 2, Korth teaches (See Fig. 1) the excited mode having transverse dimensions (width of mask (2)) at the reflective mask that are larger than a transverse dimension of each aperture.

Regarding Claims 3 and 39, Korth teaches the transverse dimensions of the excited mode at the reflective mask as more than 50 times larger than the transverse dimension of each aperture (see Col. 3, lines 45-46).

Regarding Claim 4, Korth teaches each aperture having a transverse dimension smaller than the vacuum wavelength of the electromagnetic radiation provided by the source (see Col. 2, lines 33-41).

Regarding Claim 6, Korth teaches the apertures formed by holes in the reflective mask (see Col. 4, lines 65-66).

Regarding Claim 15, Korth teaches (see Fig. 2) a dielectric material (21) (see Col. 5, lines 15-19) contacting the mask in the optical cavity.

Regarding Claim 17, Korth teaches the optical cavity as a linear optical cavity (see Col. 2, lines 15-20 and Fig. 2).

Regarding Claim 29, Korth teaches the at least one optic positioned relative to the mask forming a stable optical cavity with the mask (see Col. 2, lines 15-20 and Col. 5, lines 21-23).

Regarding Claim 30, Korth teaches (see Fig. 1) a microscopy system for imaging an object (1), the microscopy system comprising a multiple source array comprising a reflective mask (2) having an array of spatially separated apertures (see Col. 4, lines 64-66), at least one optic (25) (see Fig. 2) positioned relative to the mask to form an optical cavity with the mask (see Col. 2, lines 15-20), and a source (3) providing electromagnetic radiation to the optical cavity to resonantly excite (see Col. 2, lines 15-20) a mode supported by the optical cavity, wherein during operation a portion of the electromagnetic radiation built-up in the cavity leaks through the mask apertures towards the object (see Col. 4, lines 65-66), a multi-element photo-detector (9), and an imaging system (7) positioned to direct a return beam (27) (see Fig. 2) to the multi-element photo-detector, wherein the return beam comprises electromagnetic radiation scattered/reflected by the object back through the apertures in response to the electromagnetic radiation leaked through the apertures towards the object (see Col. 4, line 65 to Col. 5, line 6).

Regarding Claim 38, Korth teaches (see Fig. 1) a method for illuminating an object (1), comprising resonantly exciting a mode of a stable optical cavity (see Col. 2, lines 15-20) with electromagnetic radiation from a source (3), coupling electromagnetic radiation out of the optical cavity towards the object through an array (2) of apertures (see Col. 4, lines 64-66) in one of multiple optics (25, 40) (see Fig. 2) that define the cavity, wherein transverse dimensions (width of (2)) of the excited mode are larger than a transverse dimension of each aperture (see Fig. 2) and wherein each aperture has a transverse dimension smaller than the vacuum wavelength of the electromagnetic radiation provided by the source (see Col. 2, lines 33-41).

Regarding Claim 40, Korth teaches (see Fig. 1) imaging electromagnetic radiation produced by the object in response to the electromagnetic radiation coupled out of the optical

cavity towards the object (see Col. 4, line 65 to Col. 5, line 6) to a multi-element photo-detector (9).

Regarding Claim 41, Korth teaches (see Fig. 1) a microscopy method comprising resonantly exciting a mode of a stable optical cavity (see Col. 2, lines 15-20) with electromagnetic radiation from a source (3), coupling electromagnetic radiation out of the optical cavity towards the object through an array (2) of apertures (see Col. 4, lines 64-66) in one of multiple optics (25, 40) (see Fig. 2) that define the cavity, wherein transverse dimensions (width of (2)) of the excited mode are larger than a transverse dimension of each aperture (see Fig. 2), and imaging electromagnetic radiation produced by the object in response to the electromagnetic radiation coupled out of the optical cavity towards the object (see Col. 4, line 65 to Col. 5, line 6) to a multi-element photo-detector (9), wherein the imaged electromagnetic radiation (27) (see Fig. 2) produced by the object passes back through the array of apertures before being imaged to the multi-element photo-detector (see Fig. 2).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Korth in view of Chiba et al. US Patent No. 6,580,677.

Korth teaches the array in Claim 1, according to the appropriate paragraph above. Korth does not teach each aperture having a transverse dimension equal to the vacuum wavelength of the electromagnetic radiation provided by the source. Chiba et al. teach a similar device for near-field light, wherein an aperture has a transverse dimension equal to (or less than) the vacuum wavelength of the electromagnetic radiation provided by a source (see Col. 9, lines 41-44). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide an aperture with a transverse dimension equal to the vacuum wavelength of the electromagnetic radiation provided by the source, as taught by Chiba et al. in the array of Korth, to provide a wider spread of light for illuminating the object.

6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korth in view of Joannopoulos et al. US Patent No. 5,784,400.

Regarding Claim 7, Korth teaches the array in Claim 1, according to the appropriate paragraph above. Korth does not teach the apertures formed by dielectric regions in the reflective mask. Joannopoulos et al. teach an optical cavity with a reflective mask (502) (see Fig. 5) with the apertures formed by either holes (504) (see Fig. 5 and Col. 4, lines 39-41) or dielectric regions (604) (see Fig. 6 and Col. 4, lines 58-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the apertures by dielectric regions as taught by Joannopoulos et al. in the array of Korth, to provide a filled waveguide to confine the light passing through each aperture to enhance light output.

Regarding Claim 8, Korth teaches the array in Claim 1, according to the appropriate paragraph above. Korth does not teach each aperture comprising a dielectric region defining a

waveguide having transverse dimensions sufficient to support a propagating mode of the electromagnetic radiation, wherein the waveguide couples the electromagnetic energy built-up in the cavity between opposite sides of the mask. Joannopoulos et al. teach an optical cavity with a reflective mask where each aperture comprises a dielectric region (604) (see Fig. 6) defining a waveguide having transverse dimensions sufficient to support a propagating mode of the electromagnetic radiation, wherein the waveguides couple the electromagnetic energy built-up in the cavity between opposite sides of the mask (see Col. 3, lines 57-61 and Col. 4, lines 45-47- total internal reflection (TIR) maintained through each waveguide). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a dielectric region defining a waveguide having transverse dimensions sufficient to support a propagating mode of the electromagnetic radiation and couple the electromagnetic energy built-up in the cavity between opposite sides of the mask as taught by Joannopoulos et al. in the multiple source array of Korth, to provide a filled waveguide to confine the light passing through each aperture to enhance light output.

7. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korth in view of Joannopoulos et al. as applied to Claim 8, further in view of Mitsuoka et al. US Patent No. 6,528,780.

Korth in view of Joannopoulos et al. teach the array in Claim 8, according to the appropriate paragraph above. Korth also teaches (see Fig. 1) the reflective mask further comprising an end mask portion (bottom of (2)) adjacent the object. Korth does not teach each aperture having a secondary aperture formed in the end mask portion and aligned with the

waveguide, wherein the secondary aperture has a transverse dimension smaller than the transverse dimension of a corresponding waveguide. Mitsuoka et al. teach (see Fig. 1) a mask (1) for near-field scanning with an aperture (2, 3) having a waveguide (2) and a secondary aperture (3) in the end mask portion (bottom of (1)) and aligned with the waveguide, wherein the secondary aperture has a transverse dimension smaller than the transverse dimension of the waveguide (transverse dimension at top of (2)). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a secondary aperture in the end mask portion aligned with the waveguide and having a transverse dimension smaller than the transverse dimension of the waveguide, as taught by Mitsuoka et al. in the device of Korth in view of Joannopoulos et al., to further confine the light to narrow the width of the emitted light beam. Regarding Claim 10, since the transverse dimension of the aperture of Korth in view of Joannopoulos is smaller than the vacuum wavelength of the electromagnetic radiation and the transverse dimension of the secondary aperture is smaller than the transverse dimension of the waveguide in Mitsuoka et al., the transverse dimension of the secondary aperture must be smaller than the vacuum wavelength of the electromagnetic radiation provided by the source.

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Korth in view of Joannopoulos et al. and Mitsuoka et al. as applied to Claim 19, further in view of Isaacson et al. US Patent No. 4,659,429.

Korth in view of Joannopoulos et al. and Mitsuoka et al. teach the array in Claim 9, according to the appropriate paragraph above. Korth does not teach the reflective mask comprising a reflective dielectric stack surrounding the waveguides and the end mask portion

comprising a metal layer. Isaacson et al. teach (see Fig. 11) a reflective mask with a waveguide (208) and a reflective dielectric stack (200) surrounding the waveguide, wherein an end mask portion (bottom) comprises a metal layer (200). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a reflective dielectric stack surrounding the waveguide and a metal layer in the end mask portion as taught by Isaacson et al. in the array of Korth in view of of Joannopoulos et al. and Mitsuoka et al., to provide enhanced structural support for the waveguide.

9. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korth in view of Isaacson et al.

Regarding Claim 13, Korth teach the array in Claim 1, according to the appropriate paragraph above. Korth does not teach the reflective mask comprising a reflective dielectric stack. Isaacson et al. teach (see Fig. 11) a reflective mask with an aperture (208) and a reflective dielectric stack (200) surrounding the waveguide. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a reflective dielectric stack surrounding the aperture as taught by Isaacson et al. in the array of Korth, to provide enhanced structural support for the waveguide.

Regarding Claim 14, Korth in view of Isaacson et al. teach the array in Claim 13, according to the appropriate paragraph above. Isaacson et al. also teach (see Fig. 11) the reflective dielectric stack adjacent the optical cavity (aperture). Korth does not teach the reflective mask having an anti-reflection coating adjacent the object. It is well known in the art to use an anti-reflection coating to prevent reflected light from being scattered and interfering

with an imaging process. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an anti-reflection coating on the reflective mask in the array of Korth in view of Isaacson et al., to prevent multiple reflections that add unwanted stray light and reduce imaging clarity.

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Korth in view of Ueyanagi et al. European Patent Application EP 0,944,049.

Korth teaches the array in Claim 15, according to the appropriate paragraph above. Korth does not teach the dielectric material as an Amici lens. Ueyanagi et al. teach (see Fig. 15) a multiple source array comprising a reflective mask (6b, 7) having an array of spatially separated apertures (aperture within (6b) above (7a)), at least one optic (5, 6a) positioned relative to the mask, and a source (2) providing electromagnetic radiation to leak (see Paragraph 0039) radiation through the mask apertures towards an object (12), also comprising a dielectric material (6a) (see Fig. 2 and 15 and Paragraph 0027) contacting the mask wherein the dielectric material is a lens. It is design choice as to what type of lens is used in an optical system, to refract the light as desired. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a lens as taught by Ueyanagi et al. as an Amici lens in the array of Korth, to provide additional light focusing for maximal light output.

11. Claims 23, 33, 34, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korth.

Regarding Claim 23, Korth teaches the array in Claim 1, according to the appropriate paragraph above. Korth does not teach the cavity as a ring cavity. It is design choice as to use any type of resonant cavity in an optical system, depending on the space requirements and the amount of desired resonance. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a ring cavity for the optical cavity in the array of Korth, to increase resonance to increase the light output.

Regarding Claims 33, 34, and 43, Korth teaches all the elements in Claims 30 and 41, according to the appropriate paragraph above. Korth also teaches the signal beam (27) comprising electromagnetic radiation transmitted by the object through the apertures (see Fig. 2). Korth does not teach a separate multiple detector array comprising an array of spatially separated apertures, wherein the signal beam travels through the apertures of the multiple detector array. It is well known in the art to separate a single aperture array into multiple thinner, stacked, aligned aperture arrays, to provide additional structural support and rigidity. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a separate multiple detector array having an array of spatially separated apertures for the signal beam instead of using the apertures in the reflective mask, in the system and method of Korth, as it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. Nerwin v. Erlichman, 168 USPQ 177, 179. Regarding Claim 34, by using multiple stacked, aligned aperture arrays (multiple detector array and reflective mask aperture array), the apertures are identical on each array and are aligned accordingly.

12. Claims 25, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korth in view of Mongeon et al. US Patent No. 4,592,058.

Regarding Claim 25, Korth teaches the array in Claim 1, according to the appropriate paragraph above. Korth does not teach an active feedback system for maintaining the resonance between the optical cavity and the electromagnetic radiation provided by the source. Mongeon et al. teach (see Fig. 1) an active feedback system for an optical cavity (5, 7) comprising an active feedback system (9, 11, 15, 17, 19, 21, 23) for maintaining the resonance in the optical cavity and the electromagnetic radiation provided by the source (3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an active feedback system as taught by Mongeon et al. in the array of Korth, to negate the effects of temperature changes on the resonance effects of the optical cavity as taught by Mongeon et al. (see Col. 2, lines 55-59).

Regarding Claim 26, Korth and Mongeon et al. teach the array n Claim 25, according to the appropriate paragraph above. Korth does not teach an electronic controller to change the wavelength of the electromagnetic radiation. Mongeon et al. teach the active feedback system comprising an electronic controller (23) that causes the source to change the wavelength of the electromagnetic radiation in response to a servo signal (33) derived from a portion of the electromagnetic radiation (into (15)) reflected from the optical cavity. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an electronic controller as taught by Mongeon et al. in the array of Korth, to negate the effects of temperature changes on the resonance effects of the optical cavity as taught by Mongeon et al. (see Col. 2, lines 55-59).

Regarding Claim 28, Korth and Mongeon et al. teach the array in Claim 25, according to the appropriate paragraph above. Korth does not teach a transducer to dither a coupled optic. Mongeon et al. teach the active feedback system comprising an transducer (9) coupled to one of the optics (7) that form the optical cavity and an electronic controller (23) that causes the transducer to dither (see Col. 2, lines 30-46) the coupled optic in response to a servo signal (33) derived from a portion of the electromagnetic radiation (into (15)) reflected from the optical cavity. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a transducer and electronic controller as taught by Mongeon et al. in the array of Korth in view of Mongeon et al., to provide an easily-constructed component of compensating for the effects of temperature changes on the resonance effects of the optical cavity as taught by Mongeon et al. (see Col. 2, lines 55-59).

13. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Korth in view of Mongeon et al. as applied to Claim 25, further in view of Palmer US Patent No. 6,201,820.

Korth and Mongeon et al. teach the array in Claim 25, according to the appropriate paragraph above. Korth also teach (see Fig. 2) a dielectric material (21) at least partially filling the optical cavity. Korth does not teach a temperature controller and electronic controller to change the temperature of the dielectric material. Palmer teaches a laser with an optical cavity (see Col. 7, lines 3-6) with an active feedback system comprising a temperature controller (20) (see Fig. 1) coupled to the optical cavity and an electronic controller (18) that causes the temperature controller to change the temperature of the optical cavity in response to a servo signal (see Col. 2, lines 35-47) derived from the electromagnetic radiation reflected (into (28)

and (30)) from the optical cavity. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the temperature controller and electronic controller of Palmer in the multiple source array of Korth in view of Mongeon et al., to provide a durable method of maintaining a stable resonant frequency and a constant optical cavity length without fragile, moving parts.

14. Claims 31, 35, 42, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korth in view of Krantz US Patent No. 6,248,988.

Korth teaches the microscopy system and method in Claims 30, 33, 41, and 43, according to the appropriate paragraph above. Korth also teaches the multi-element photo-detector comprising multiple detector elements (32) (see Fig. 3). Korth does not teach a pinhole array positioned adjacent the multi-element photo-detector, wherein each pinhole is aligned with a separate set of one or more of the detector elements, and wherein the imaging system produces a conjugate image of each aperture on a corresponding pinhole of the pinhole array. Krantz teaches (see Fig. 15) a similar microscopy system with a pinhole array (see Col. 13, lines 35-37) positioned adjacent a multi-element photo-detector (252), wherein each pinhole is aligned with a separate set of one or more of the detector elements (each of the detector elements, to make the active area size of each detector smaller- see Col. 13, lines 35-37), and wherein the imaging system produces a conjugate image of each aperture on a corresponding pinhole of the pinhole array (since each detector element corresponds to a distinct pinhole to reduce the detector's active area size and each detector corresponds to a light spot from an aperture- see Col. 3, lines 49-54). It would have been obvious to one of ordinary skill in the art at the time the invention was made

to use a pinhole array adjacent to the multi-element photo-detector with each pinhole aligned with a detector element with each pinhole corresponding to a conjugate image from an aperture, as taught by Krantz, in the microscopy system of Korth, to provide individual detector-element focus to reduce distortion from the use of large optics.

15. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Korth in view of Balasubramanian US Patent No. 4,340,306.

Korth teaches the method in Claim 40, according to the appropriate paragraph above. Korth does not teach interfering the imaged electromagnetic radiation with reference electromagnetic radiation at the multi-element photo-detector, where the two radiations are from a common source. Balasubramanian teaches a microscopy system with an interferometer which separates the source into a measurement beam and a reference beam (see Col. 3, lines 21-24) and combined with the signal beam to interfere (see Col. 3, lines 24-30) at a multi-element photo-detector (25) (see Fig. 1 and Col. 3, lines 30-34), wherein the two beams are derived from a common source (13). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the interferometer as taught by Balasubramanian in the method of Korth, to provide accurate scanning of non-regular reflective surfaces, as taught by Balasubramanian (see Col. 3, lines 55-61).

Allowable Subject Matter

16. Claims 22, 24, 46, and 47 are allowed over the prior art of record.

17. Claims 12, 18-21, 27, 32, and 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. The following is a statement of reasons for the indication of allowable subject matter:

Regarding Claim 12, the array as claimed, specifically in combination with a second optical cavity on the waveguide between opposite sides of the mask in addition to a first optical cavity, is not disclosed or made obvious by the prior art of record.

Regarding Claims 18-20, the array as claimed, specifically in combination with the linear optical cavity formed by the optic and a second surface defined by the interface between the reflective mask and the dielectric material, is not disclosed or made obvious by the prior art of record.

Regarding Claims 21 and 22, the array as claimed, specifically in combination with a folded optical cavity formed by three surfaces defined by the first optic, the second optic, and the interface between the reflective mask and a dielectric material, is not disclosed or made obvious by the prior art of record.

Regarding Claim 24, the array as claimed, specifically in combination with a ring cavity containing two optics in the at least one optic and formed by three surfaces including the two optics and the interface between the reflective mask and dielectric material, is not disclosed or made obvious by the prior art of record.

Regarding Claim 27, the array as claimed, specifically in combination with changing the temperature of the dielectric material in response to a signal derived from a portion of the reflected electromagnetic radiation, is not disclosed or made obvious by the prior art of record.

Regarding Claims 32, 36, 46 and 47, the microscopy system as claimed, specifically in combination with an interferometer which separates the electromagnetic radiation into a measurement beam and reference beam and combines it with a return beam to interfere at the multi-element photo-detector, is not disclosed or made obvious by the prior art of record.

Response to Arguments

19. Applicant's arguments with respect to claims 1-36 and 38-47 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (571)272-2449. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571)272-2444. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-3329.

SY

SY

THANH X. LUU
PATENT EXAMINER